Addressing societal and engineering challenges in the 21st century requires engineers to think holistically about the systems we design and build. Public policy often dictates what engineering projects are commissioned and what values are being optimized for in engineering practice (e.g. cost, beauty, environment, safety, equity). However, too few engineers understand the drivers of public policy, how public policy is developed, and the role it plays in engineering. Similarly, too few policy makers understand the applied science of engineering. The interplay between policy and civil engineering is particularly acute in the urban environment, where civil engineering works (transportation, housing, water services, libraries etc.) are concentrated and where, in Canada, the public policies of three levels of government influence engineering practice.

This seminar course challenges engineers to think about how public policy is made and how it guides the practice of engineering both directly and indirectly. Particular focus is placed on urban policy and urban engineering. The first month of the course will deal with the process of urban policy making examining how issues emerge, how important ideas are framed, priorities are established, and agendas are set and managed. Factors to be considered include the role of bureaucratic and political actors, organized interests and non-governmental groups, the importance and influence of networks, and the potential for new models and options for the engagement of stakeholders and citizens at large.

The second and third month of the course will focus on the relationship between public policy and the practice of civil engineering. The focus of the course will be to examine the myriad ways public policy and priorities intersect with the development of the built environment. The relationship between public policy and engineering in housing, transport, energy, water and sustainability will be discussed. The focus of the course will be on Canadian cities with examples from cities located elsewhere in the high-income world; examples and experiences from other parts of the world are welcomed.

Textbook and Readings

There is no textbook for this course, background material will be provided on the Quercus website for weekly readings. The required readings are a mandatory part of the course; significant time should be dedicated each week to the assigned readings. Required readings are to be read in advance of the seminar for which they are listed. Further suggested reading lists are provided for students who seek to advance their knowledge and understanding.

Students who wish to purchase a good book on urban policy and governance in Canada might consider one of the following:


2) Andrew Sancton and Robert Young, eds. 2009. Municipal Government in Canada’s Provinces Toronto: University of Toronto Press (paper).


Marks and Grading

Participation and contribution to in-class discussions: 20%

Book review paper: 30%

Final policy and engineering paper: 50%

Grading:

B grades will be given for reasonable quality work that meets the expected standards of graduate level work. A level work is clearly superior and will demonstrate insight into the topic in addition to what has been presented in class or assigned in readings (e.g. further thought). A+ level work is truly exceptional. It is objectively superior to what could have been fairly expected and has caused the reader to think, or see an issue – at least temporarily – in a new way. C grades will be given to work that fails to meet expectations. Modifiers (+ and -) will be given to work that falls between these categories.

Marking Rubric for Class Participation

<table>
<thead>
<tr>
<th>Grade</th>
<th>Attendance</th>
<th>Readings</th>
<th>Class Discussions</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Attends all lectures, or all lectures less one (unexcused absence)</td>
<td>Supplements required readings with further thought either through engagement with suggested readings or other additional resources found by the student</td>
<td>Actively participates in seminar discussions, is thoughtful and thought provoking. Demonstrates understanding and insight into the readings. Is respectful of differing opinions. Adds new ideas and perspective to seminar discussions.</td>
</tr>
<tr>
<td>B</td>
<td>Misses no more than 2 lectures (unexcused absences)</td>
<td>Reads all required readings</td>
<td>Actively participates in seminar discussions, is thoughtful. Demonstrates understanding of the readings. Is respectful of differing opinions.</td>
</tr>
<tr>
<td>C</td>
<td>Misses no more than 4 lectures (unexcused absences)</td>
<td>Reads ~70% of required readings</td>
<td>Participates somewhat in seminar discussions</td>
</tr>
<tr>
<td>D</td>
<td>Misses more than 4 lectures (unexcused absences)</td>
<td>Reads half of the required readings</td>
<td>Participates minimally in seminar discussions</td>
</tr>
</tbody>
</table>
Academic Integrity

“Students in graduate studies are expected to commit to the highest standards of integrity and to understand the importance of protecting and acknowledging intellectual property. For example, it is assumed that they bring to their graduate studies a clear understanding of how to cite references appropriately, thereby avoiding plagiarism. See for example, How Not to Plagiarize. Regarding plagiarism, the Code includes the following statements:

B.i.1. It shall be an offence for a student knowingly:
   (d) to represent as one's own idea or expression of an idea or work of another in any academic examination or term test or in connection with any other form of academic work, i.e., to commit plagiarism.

Wherever in the Code an offence is described as depending on "knowing," the offence shall likewise be deemed to have been committed if the person ought reasonably to have known.

Other academic offences include the possession and/or use of unauthorized aids in examinations, submitting the same paper for different courses, forgery (whether of academic records or other documents), concocting facts or references to sources, personating someone, and other forms of cheating and academic dishonesty. Please refer to sections B.i.1. and B.i.3. in the Code for detailed descriptions of offences applicable to students.”

Source: [http://www.sgs.utoronto.ca/facultyandstaff/Pages/Academic-Integrity.aspx](http://www.sgs.utoronto.ca/facultyandstaff/Pages/Academic-Integrity.aspx)

Further resources (not exhaustive):
CEM 1001H: The Challenges of Urban Policy Making
Unit One Reading List

Week 1: Introduction to cities, urban policy and engineering
September 13, 2018

Required readings:


Suggested readings:


Canada Infrastructure (2016) “Informing the Future: Canada Infrastructure Report Card”, canadainfrastructure.ca,

Week 2: Local Government
September 20, 2018

Required Readings


Shah, Anwar. 2006. “A Comparative Institutional Framework for Responsive, Responsible, and Accountable Local Governance” in Anwar Shah, ed. 2006. Local Governance in Industrial Countries Washington: The World Bank, pp. 1-40. [Note to students: browse over this article, no need to read it closely unless you’re particularly interested]

Supplementary Readings


Week 3: The Policy Process
September 27, 2018

Required Readings


Supplementary Readings


Week 4: District Energy Field Trip (City of Toronto)  
October 4th, 2018

Required Readings

UN District Energy in Cities Initiative,  
http://www.districtenergyinitiative.org/sites/default/files/publications/desoverview12-pageslight-version-21092017534.pdf. Comprehensive description of all aspects of district energy with case studies from around the world. (Suggested chapters for reading: 1.1-1.4, 2.1-2.5)

Chapter 10: Building Resilient Cities: Focusing on the Essential Thermal Grid. Canadian Academy of Engineering, Drs Clem Bowman and Richard Marceau


Supplementary Readings

Carou, Fernando, (2018). The Role of Thermal Networks for Low-Carbon Resilient Communities, IDEA Annual Conference June 13, 2018,  


Enwave Deep Lake Water Cooling System, System tour description,  
https://www.linkedin.com/pulse/planning-low-carbon-future-ingredients-matter-david-macmillan-mes/?lipi=urn%3Ali%3Apage%3Ad_flagship3_profile_view_base_recent_activity_details_all%3B5e0Hy5L1RX%2BdSMc2DHs9EQ%3D%3D


**CEM 1001H: The Challenges of Urban Policy Making**

**Unit Two Reading List**

**Week 5:** Buildings, Housing, Land Use

October 11, 2018

**Required Reading:**


**Further Reading:**


**Week 6:** Transportation

October 18, 2018

**Required Reading:**


Canada’s Ecofiscal Commission. 2015. *We Can’t Get To There From Here: Why Pricing Traffic Congestion is Critical to Beating It*. November. [Concentrate on pgs. 1-32]
Elon Musk and the Boring Company (Start of the talk, don’t need to watch the entire video).
https://www.ted.com/talks/elon_musk_the_future_we_re_building_and_boring


Further Reading:

Canada’s Ecofiscal Commission. 2015. We Can’t Get To There From Here: Why Pricing Traffic Congestion is Critical to Beating It. November. [Concentrate on pgs. 1-32]

Week 7: Waterfront Toronto
October 25, 2018

Required Reading:

Further Reading:

Sidewalk Toronto https://sidewalktoronto.ca
Waterfront Toronto http://www.waterfronttoronto.ca/nbe/portal/waterfront/Home


Week 8:   Sustainability and Resilience
November 1, 2018

The Rockefeller Foundation, Arup, City Resilience Index: Understanding and Measuring City Resilience (2017)


Further Reading:


Week 9: Water
November 8, 2018

Required Reading:
Caspar Honegger, Christoph Oehy (2016) The road to flood resilience in Canada, Managing Editor: Urs Leimbacher, Swiss Re Corporate Real Estate & Logistics/ Media Production, Zürich


Further Reading:


Week 10: Energy
November 15, 2018

Required Reading:


Further Reading:
http://digital.library.pitt.edu/islandora/object/pitt:31735062135888

Week 11: Small Cities — Big Cities
November 22, 2018
